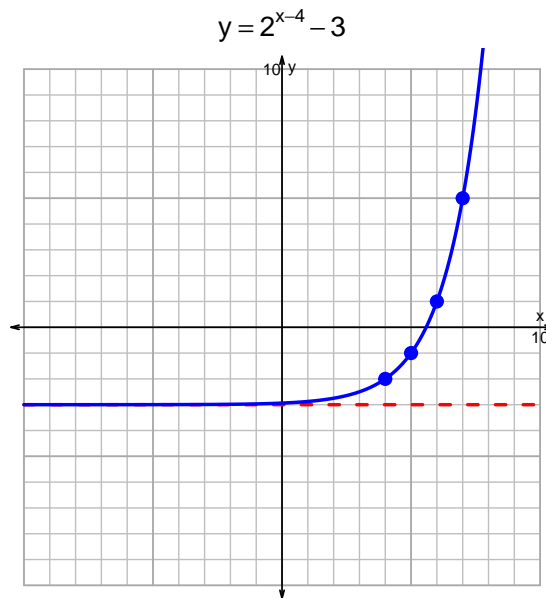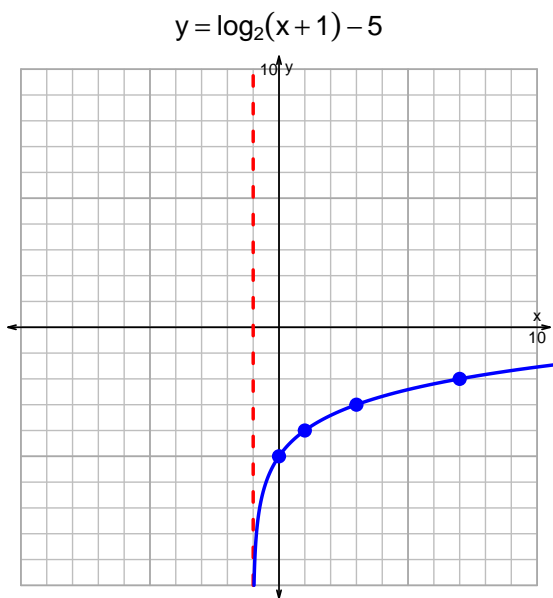## s18: EXP LOG (SLTN v362)

1. (10 pts) Graph $y = \log_2(x+1) - 5$ and $y = 2^{x-4} - 3$ on the grids below. Also, draw any asymptotes with dashed lines.

$$y = \log_2(x+1) - 5$$

$$y = 2^{x-4} - 3$$

Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-13 = \left(\frac{-4}{3}\right) \cdot 2^{5t/7}$$

Divide both sides by $\frac{-4}{3}$.

$$\frac{13 \cdot 3}{4} = 2^{5t/7}$$

Take log, base 2, of both sides.

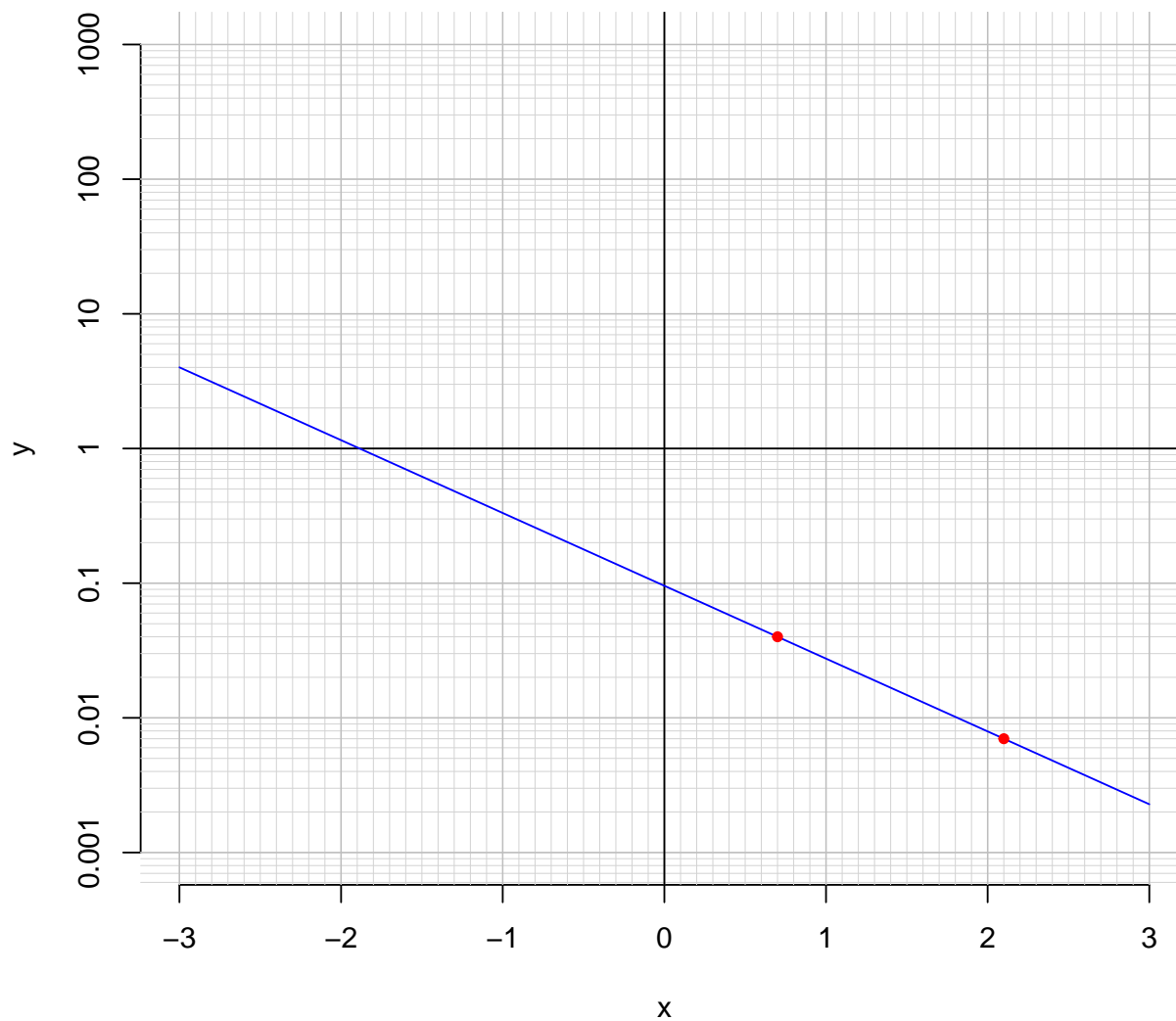$$\log_2\left(\frac{13 \cdot 3}{4}\right) = \frac{5t}{7}$$

Divide both sides by $\frac{5}{7}$.

$$\frac{7}{5} \cdot \log_2\left(\frac{13 \cdot 3}{4}\right) = t$$

Switch sides.

$$t = \frac{7}{5} \cdot \log_2\left(\frac{13 \cdot 3}{4}\right)$$

3. (10 pts) An exponential function $f(x) = 0.0956 \cdot e^{-1.24x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(2.1)$.

$$f(2.1) = 0.007$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{1.24} \cdot \ln\left(\frac{x}{0.0956}\right)$$

Using the plot above, evaluate $f^{-1}(0.04)$.

$$f^{-1}(0.04) = 0.7$$